

THE CLAIMS

The following represents a complete set of the claims presented in the present application and their current status:

1 (currently amended). A cardiac pacing system for use with unipolar or bipolar atrial and ventricular pacing and sensing leads, said cardiac pacing system including:

(a) at least an atrial lead having atrial electrodes comprising an atrial tip electrode and an atrial ring electrode electrically coupled thereto;

(b) at least a ventricular lead having ventricular electrodes comprising a ventricular tip electrode and a ventricular ring electrode electrically coupled thereto;

(c) pacing means for providing a pacing stimulus to at least one of an atrium or ventricle of a heart, said pacing means electrically coupled to at least one of said atrial lead and said ventricular lead;

(d) sensing means for sensing a response evoked by the pacing stimulus, said sensing means electrically coupled to at least one of said atrial lead and said ventricular lead said sensing means including multiple independent blanking switches corresponding to independent electrodes;

(e) an indifferent electrode and an electrically conductive can that contains the pacing and sensing means, said

indifferent electrode being positioned on the can;

(f) afterpotential attenuation means for attenuating afterpotentials which result due to the application of the pacing stimulus to the heart by said cardiac pacing system, said afterpotential attenuation means being electrically coupled to said pacing means and having a reduced coupling capacitance of less than 5 microfarads; and

(g) wherein the sensing means can sense evoked responses between all combinations of any two of said electrodes.

2 (cancelled).

3 (previously amended). The cardiac pacing system as recited in claim 1 wherein the signal associated with the evoked response is sensed between the atrial tip electrode and the indifferent electrode.

4 (previously amended). The cardiac pacing system as recited in claim 2, wherein the signal associated with the evoked response is sensed between the ventricular ring electrode and the ventricular tip electrode.

5 (previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response is sensed between the atrial ring electrode and the indifferent electrode.

6 (previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response

is sensed between the ventricular tip electrode and the indifferent electrode.

7 (previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response is sensed between the ventricular ring electrode and the indifferent electrode positioned on a can of the cardiac pacer and electrically coupled to the cardiac pacer.

8 (previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response is sensed between the atrial ring electrode and one of the ventricular electrodes.

9 (previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response is sensed between the atrial tip electrode and one of the ventricular electrodes.

10 (previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response is sensed between the ventricular ring electrode and the atrial tip electrode.

11 (previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response is sensed between the atrial tip electrode and the electrically conductive housing of the cardiac pacing system.

12 (previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response

is sensed between the atrial ring electrode and the electrically conductive housing of the cardiac pacing system.

13(original). The cardiac pacing system as recited in claim 2, wherein the signal associated with the evoked response is sensed between the atrial ring electrode ventricular tip electrode.

14(previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response is sensed between the ventricular ring electrode and the electrically conductive housing of the cardiac pacing system.

15(previously amended). The cardiac pacing system as recited in claim 1, wherein the signal associated with the evoked response is sensed between the ventricular tip electrode and the electrically conductive housing of the cardiac pacing system.

16(original). The cardiac pacing system as recited in claim 1, wherein said afterpotential attenuation means includes first coupling capacitor means for attenuating afterpotential operatively coupled to second coupling capacitor means for blocking DC components, and also includes switching means for selectively coupling said second coupling capacitor means in series with said first coupling capacitor means so as to reduce the effective capacitance of said second capacitor means.

17(original). The cardiac pacing system as recited in claim 16, wherein said first coupling capacitor means has a substantially smaller capacitance than said second coupling capacitor means.

18(original). The cardiac pacing system as recited in claim 16, wherein said second coupling capacitor means has a capacitance ranging from 10-40 microfarads, and said first coupling capacitor means has a capacitance less than 5 microfarads.

19. (currently amended) A cardiac pacing system for use with unipolar or bipolar atrial and ventricular pacing and sensing leads, said cardiac pacing system including:

- (a) at least an atrial lead having atrial electrodes comprising an atrial tip electrode and an atrial ring electrode electrically coupled thereto;
- (b) at least a ventricular lead having ventricular electrodes comprising a ventrical tip electrode and a ventrical ring electrode electrically coupled thereto;
- (c) a pacing circuit including a pacing charge storage capacitor that provides a pacing stimulus to at least one of an atrium or ventrical of a heart, said pacing circuit electrically coupled to at least one of said atrial lead and said ventricular lead;
- (d) a sensing circuit that senses a response evoked by the pacing stimulus, said sensing circuit electrically coupled to at least one of said atrial lead and said ventricular lead, said sensing circuit including multiple independent blanking switches corresponding to independent electrodes;
- (e) an indifferent electrode and an electrically conductive

can that contains the pacing and sensing means, said indifferent electrode being positioned on the can;

- (f) coupling capacitors electrically coupled together wherein a capacitance of the capacitors coupled together has a combined reduced capacitance of less than 5 microfarads wherein the combined reduced capacitance of less than 5 microfarads attenuates afterpotentials which result due to the application of the pacing stimulus to the heart by said cardiac pacing system, said capacitors being electrically coupled to said pacing circuit; and
- (g) wherein the sensing circuit can sense evoked responses between all combinations of any two of said electrodes.

20 (cancelled).

21 (previously amended). The cardiac pacing system as recited in claim 20 wherein the signal associated with the evoked response is sensed between the atrial tip electrode and the indifferent electrode.

22 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the ventricular ring electrode and the ventricular tip electrode.

23 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the atrial ring electrode and the indifferent electrode.

24 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the ventricular tip electrode and the indifferent electrode.

25 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the ventricular ring electrode and the indifferent electrode.

26 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the atrial ring electrode and one of the ventricular electrodes.

27 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the atrial tip electrode and one of the ventricular electrodes.

28 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the ventricular ring electrode and the atrial tip electrode.

29 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the atrial tip electrode and the electrically conductive housing of the cardiac pacing system.

30 (previously amended). The cardiac pacing system as recited

in claim 19, wherein the signal associated with the evoked response is sensed between the atrial ring electrode and the electrically conductive housing of the cardiac pacing system.

31 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the atrial ring electrode and ventricular tip electrode.

32 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the ventricular ring electrode and the electrically conductive housing of the cardiac pacing system.

33 (previously amended). The cardiac pacing system as recited in claim 19, wherein the signal associated with the evoked response is sensed between the ventricular tip electrode and the electrically conductive housing of the cardiac pacing system.

34 (previously added). The cardiac pacing system as recited in claim 19, wherein said capacitors includes a first coupling capacitor that attenuates afterpotential, operatively coupled to a second coupling capacitor that blocks DC components, and also includes switches for selectively coupling said second coupling capacitor in series with said first coupling capacitor so as to reduce the effective capacitance of said second capacitor.

35 (previously added). The cardiac pacing system as recited in claim 34, wherein said first coupling capacitor has a